

Wells such as this one in the mountain village of Qadam Joy in northern Afghanistan are nearly empty as a result of prolonged drought

than mini-hydropower schemes also will need to apply accepted international norms for environmental and social planning and protection such as those based on the recommendations of the World Commission on Dams.

Wetlands are another important "user" of river water that should not be forgotten in establishing sustainable rates of upstream water withdrawals. Many of Afghanistan's rivers have no outlet to the sea and drain into a series of depressions from which water is lost by evaporation. This results in the formation of large shallow saline lakes and marshes, which are biologically productive ecosystems of international importance for migrating and wintering water birds. These ecosystems also produce fish, down feathers, and reeds harvested by local populations that represent important sources of income. Failure to take these values into account when competition has occurred for scarce water resources has led to the degradation of wetlands from low and increased salinity flows resulting in loss of natural habitat and subsequent elimination of wildlife species.

Another important consideration in the redevelopment of water management institutions relates to respect for traditional water resource rights at all scales—from the well or *karez* system (underground water channels) to the stream or irrigation canal and even to the level of the river basin. Special care should be taken to understand past, and often sustainable, patterns of water resource use and allocation as the basis for introducing any suggested infrastructure improvements.

Traditional farming in Afghanistan has been practiced since historical times and provides the most efficient use of the limited water supply from glacial streams, springs, and *karez* systems, which are prevalent in the arid parts of the country. *Karez* systems comprise a network of wells connected through underground tunnels, and represent one of the most efficient ways of collecting unpolluted water. Only traditional technology is required to build them and they have low maintenance costs. The 3,000-year-old *karez* system is labor intensive, conserves water and soil, and creates a diverse biotic environment. This system has little adverse effect on aquifers, as the water is supplied by springs. However, the functioning of *karez* systems has been severely compromised by the bombing of mountainous areas of the country.

Karez systems and other traditional agricultural practices in Afghanistan conserve natural resources, while large-scale agricultural projects have created serious environmental problems such as the salinization of soils and drying up of major wetlands. In Afghanistan's arid environment, the few existing wetlands are of enormous value for maintaining a balance between development and biological diversity.

Afghanistan's territory is drained by three large river basins: the Amu Darya River Basin in the northeast, which flows into Tajikistan and Uzbekistan to the Aral Sea; the Indus River Basin in the east, which flows through Pakistan to the Arabian Sea; and the desert river basins that flow into lakes and marshes along the border with Iran in the south and southwest (streams only flow into the Pakistan province of Baluchistan during the spring and early summer). Of the eight principal sub-basins in Afghanistan, only three can be exclusively used by the country: the Southwestern Basin, which includes the Farah, Harut, and Kajrud Rivers among others; a group of small rivers in the north and northwest, including the Murghab and Balkhab Rivers; and tributaries to the Amu Darya before the river forms the border with Tajikistan.

The remaining sub-basins, including all the substantial perennial rivers in the rest of the country, are shared with neighboring countries. This raises issues of international transboundary water management affecting especially the Kunduz, Pania, and Kokcha Rivers in the north (flowing to the Amu Darya River and Aral Sea through

Tajikistan, Turkmenistan, and Uzbekistan), the Hari Rud River in the west (flowing to Iran), and the Kabul River in the east (flowing to the Indus River through Pakistan). A water sharing agreement exists with Iran for the Helmand River, but nothing has been done in this regard for many years. There were also several agreements between Afghanistan and the now defunct Union of Soviet Socialist Republics (USSR) covering the Amu Darya River: the Frontier Agreement between Afghanistan and the USSR of 1946; and the Protocol between the Soviet Union and Afghanistan on joint execution of works for the integrated utilization of water resources in the frontier section of the Amu Darya of 1958. These agreements entitled Afghanistan to use 9 cubic kilometers (km^3) of Amu Darya waters or about 13% of what is now estimated as the long-term average annual river discharge of 70 km^3. Afghanistan currently uses about 2 km^3 or 3% of the average annual river discharge.

In time, international dialogue and institutional structures will be needed to deal with interstate agreements governing the use of these shared waters. Especially in the case of the Amu Darya Basin in the north, it may be prudent to open early communications with the Tashkent-based Interstate Commission for Water Coordination and the Amu Darya River Basin Authority (known as the BVO Amu Darya), which manage water allocation for the area of the Aral Sea Basin falling within the five former Soviet Central Asian republics. This would help address disagreements over water allocation as the irrigation systems of Afghanistan's northern plains are redeveloped.

Development of the balance of surface water (as indicated in Table 3) will likely require some major storage investments that will affect transboundary stream flow patterns. Accelerated groundwater development will also reduce baseflows of these rivers in the summer and fall seasons, which downstream users have recently come to expect. As pressure builds to expand water resource development in Afghanistan, these riparian issues concerning water sharing will have to be addressed to avoid costly delays and disagreements.

An estimated 99% of developed water resources are used for irrigation. Demands on surface water and groundwater resources are likely to grow substantially in the near term due in part to the large number of returning refugees and IDPs. Villages, towns, and cities will demand improved drinking water supplies as a high priority. Hydropower resources will need to be developed to meet energy needs in both rural and urban areas, and industrial development to expand employment will require reliable supplies of water. Domestic and industrial demands also may negatively affect water quality in the absence of effective monitoring and enforcement of environmental standards. Traditionally, village irrigation schemes were used to deliver water not only to crops but also to the village for domestic, livestock, and other uses. Many villages may be able to shift to better quality groundwater supplies, but this will require increased investment and far more vigilant management of groundwater recharge and groundwater quality. It is clear, therefore, that even if the development of remaining surface water resources for irrigation is deferred for the longer term, improved water resource management will be required in the short to medium term to overcome barriers and constraints to full recovery and sustained growth in the country.

Water conservation and harvesting is another area deserving immediate attention. This can be accomplished through soil, pasture, and vegetative and forest cover management; and construction of check dams, contour bunds, and other facilities to conserve water and enhance groundwater recharge in all watersheds. The wet season is short in Afghanistan (from December to April), and it comes at a time when vegetative cover is low and many areas are still covered by snow. Moreover, years of deforestation and conversion of pasture to rainfed cultivation (especially for growing wheat) have left much of the landscape denuded and degraded. Global experience has demonstrated in a wide range of arid environments similar to Afghanistan that water harvesting measures combined with pasture restoration and reforestation can improve water management; increase water available for drinking, livestock, and irrigated farming; and strengthen

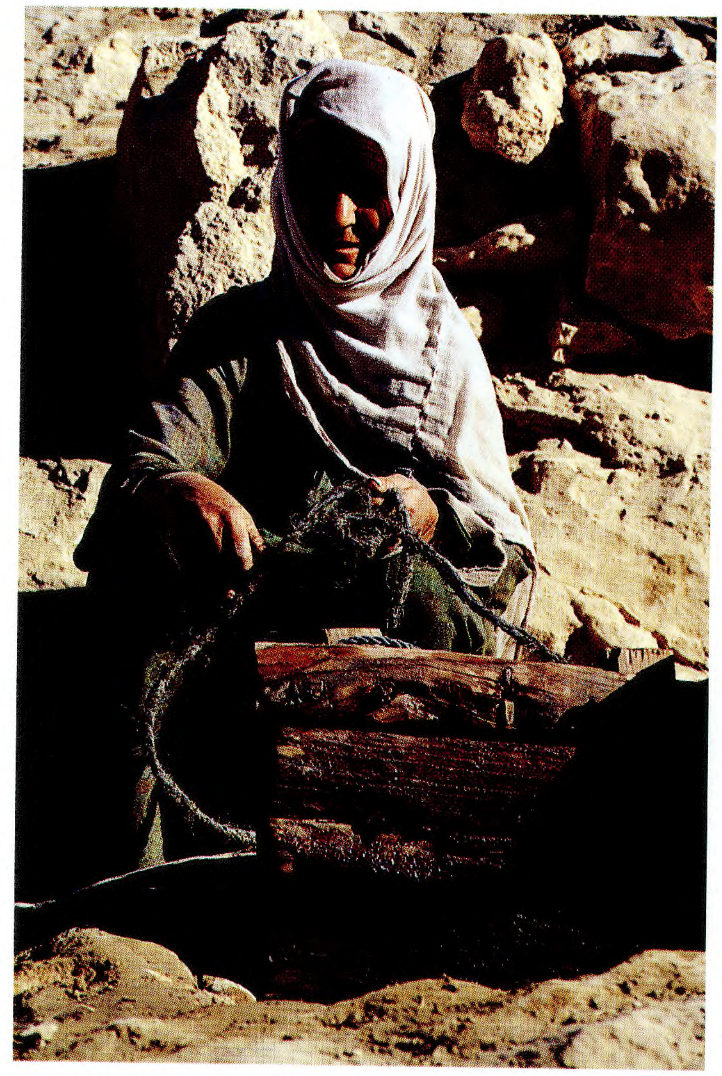
Table 3: Preliminary Water Balance for Afghanistan (million m^3)

Water Resources	Potential	Present Use	Balance	Future Use[a]	Balance
Surface Water	57,000	17,000	40,000	30,000	27,000
Groundwater	18,000	3,000	15,000	5,000	13,000
Total	**75,000**	**20,000**	**55,000**	**35,000**	**40,000**

[a] With all irrigation schemes rehabilitated and managed efficiently.
Source: FAO. 1997. *Afghanistan Agriculture Strategy.*

livelihoods and reduce their vulnerability in a variety of ways. The resulting additional area of irrigated land, although small, is important in areas where water supplies are so scant, especially when farmers irrigate high value-added crops such as nuts, fruit, fodder, and vegetables. Water harvesting measures are also very labor intensive and offer the ITGA an important opportunity to generate short-term employment during the current emergency.

Persistent droughts and the availability of donor financing have provided a stimulus to groundwater depletion by means of deep tubewells and in the process, resulted in a lowering of water tables. For example, the springs around Kabul that lie within their zone of influence have dried up. This is a serious and possibly catastrophic development for Afghanistan if it is not correctly managed. Not only does the country possibly lose important drought reserves, but water rights are illegally transferred from those who owned and used the spring or *karez* to those who are able to invest in the tubewell. Until the ITGA is able to develop an effective monitoring and regulatory system for groundwater, it would seem sensible and prudent to develop and implement a monitoring program on an urgent basis in sensitive areas and to restrict and/or ban the expanded use of deep tubewells.



Shrinking forests make firewood difficult to obtain

Forests

Traditionally, Afghanistan's tribes preserved forests and range resources through division of land use. However, the most significant and visible adverse environmental consequence of the conflict period in Afghanistan has been the loss of forest cover. Historical accounts show extensive forests in the region north of Kabul with relic patches of woodland existing in Istalif and Charikar, north of Kabul. In his 16th century memoirs, Emperor Babur gave an account of forests around Kabul. This suggests that vast areas of forest in various parts of the country have been destroyed by overgrazing and cutting in the recent past.[6]

FAO and UNDP estimates in the early 1980s place the area of forests at approximately 2.2 million ha. From that time to 1991, the forest area declined from an already low base of 3.4% to only 2.6% of total land area, or about 1.9 million ha. As indicated in Figure 4 (in Chapter I), the latest estimates indicate that forest area stands at approximately 2% of the country's land area. As energy supplies were disrupted during the period of conflict, the cutting of forests for fuelwood accelerated. Many forests also were purposely cleared during the war years for security reasons, especially those adjacent to roads and other infrastructure. The deforestation process has now reached a stage where near total loss of forests may be imminent unless urgent and decisive conservation measures are taken.

The remaining forests of Afghanistan still provide a variety of environmentally and economically important services. From an environmental standpoint, they are crucial to watershed protection, and natural forests represent important indigenous ecosystems and habitats. These environmental services generate significant though largely non-market values associated with short-term flood protection, erosion control, aesthetics, and biodiversity conservation. The country's forests are also an important source of saleable timber and non-timber products, including fuelwood, charcoal, roots, and nuts.

Further loss of forest cover, primarily from steep mountainsides, will compound the problems associated with poor watershed management, including slope destabilization, soil erosion, and reservoir siltation. The management of timber forests is of particular concern. Reports have cited pistachio forests being cut for firewood and stands of old growth cedar in the eastern provinces being felled for the lucrative export trade in timber. Furthermore, demand for both building materials and fuelwood is expected to mushroom with the return of

6 See also: ADB. 2002. *Afghanistan Natural Resources and Agriculture Sector Comprehensive Needs Assessment—Draft Report*. Manila, especially Appendix 2: Natural Resources Management, which covers forestry, agroforestry, and watershed management.

refugees, thereby threatening the remaining accessible forestland in the absence of external supplies.

As in the case of renewed water management efforts in rural communities, special attention will need to be given to understanding past, and often sustainable, patterns of forest resource use and allocation. While many traditional community-based systems of forest management were disrupted during the period of conflict, they deserve close investigation to reintroduce appropriate local incentives for sustainable forest management. There also is a legitimate and important role for the private sector to play in the country's forest resource development—particularly in establishing commercial forest plantations under appropriate environmental safeguards.


Livestock near a river in northern Afghanistan where fodder is scarce.

Rangelands

Pastures are estimated to cover approximately 40 million ha of Afghanistan's territory, or nearly 60% of the total land area, and animal husbandry produces an essential component of rural income. Prior to the extended period of conflict, approximately 15 million ha of lowlands and steppes were used for winter grazing, while 25 million ha of mountainous lands served as spring and summer pastures. The total carrying capacity of the country's current grazing lands for different ruminants (sheep, goats, and cattle) has not yet been determined. In 1978/79, 40 million ha of pastures supported an estimated 25 million animals. Nomadic herding communities traveled long distances with their animals to exploit the spring and summer grazing lands in mountain ranges, returning each winter to the eastern and southeastern lowlands of Afghanistan and the border region with Pakistan.[7]

To better understand both the land resource management challenges and economic potential of these activities, it is important that investigations and assessments be initiated soon on pastoral nomads, with particular emphasis on their migratory patterns, range utilization by domestic stock, and the specific implications for land resource management. Once again, traditional institutional arrangements within pastoral communities limited access to rangelands so that grazing levels were kept within the regenerative capacities of the land. These systems should be understood and respected wherever feasible. Improving the productivity of pastures and returns to animal husbandry holds the promise of generating improved incomes for some of Afghanistan's poorest communities. As water, forest, and rangeland management are all closely interlinked, integrated approaches—perhaps within the framework of river basin management, when applicable—should be used to the greatest extent possible.

Biodiversity/Protected Areas[8]

Afghanistan's position within the region where the Palaearctic and Oriental faunal realms intermingle highlights its zoogeographic and international importance, not only in terms of biodiversity and endemism but also for the occurrence of flagship endangered species such as the markhor (*Capra falconeri*), Marco Polo sheep (*Ovis ammon poli*), musk deer (*Moschus moschiferus*), snow leopard (*Uncia uncia*), and Siberian crane (*Grus leucogeranus*). There are some 441 bird species in the country that

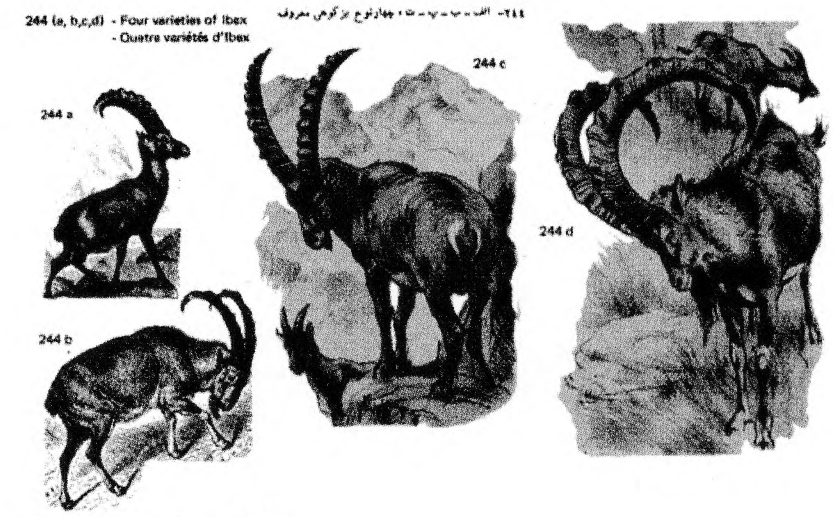
7 See also: ADB. 2002. *Afghanistan Natural Resources and Agriculture Sector Comprehensive Needs Assessment—Draft Report*. Manila, especially Appendix 6: Livestock Production and Animal Health.

8 Among other sources, this section draws from: (1) Habibi, K. 2002. *Environmental Conservation in Afghanistan: a Proposal*. Unpublished. (2) Habibi, K. 2002. Personal communication. (3) Hogan, R. (compiler). 2002. *Natural Heritage Documentation for Afghanistan, Vol 1. IUCN Programme on Protected Areas.* Gland, Switzerland: Unpublished. (4) Petocz, R. and J. Larsson. 1977. *Ecological Reconnaissance of Western Nuristan with Recommendations for Management.* FAO:DP/AFG/74/016 Field Document #9. Kabul: UNDP/FAO/Department of Forests and Range, Ministry of Agriculture. (5) UNDP/FAO. 1981. *Afghanistan National Parks and Wildlife Management: A Contribution to a Conservation Strategy*. Rome.

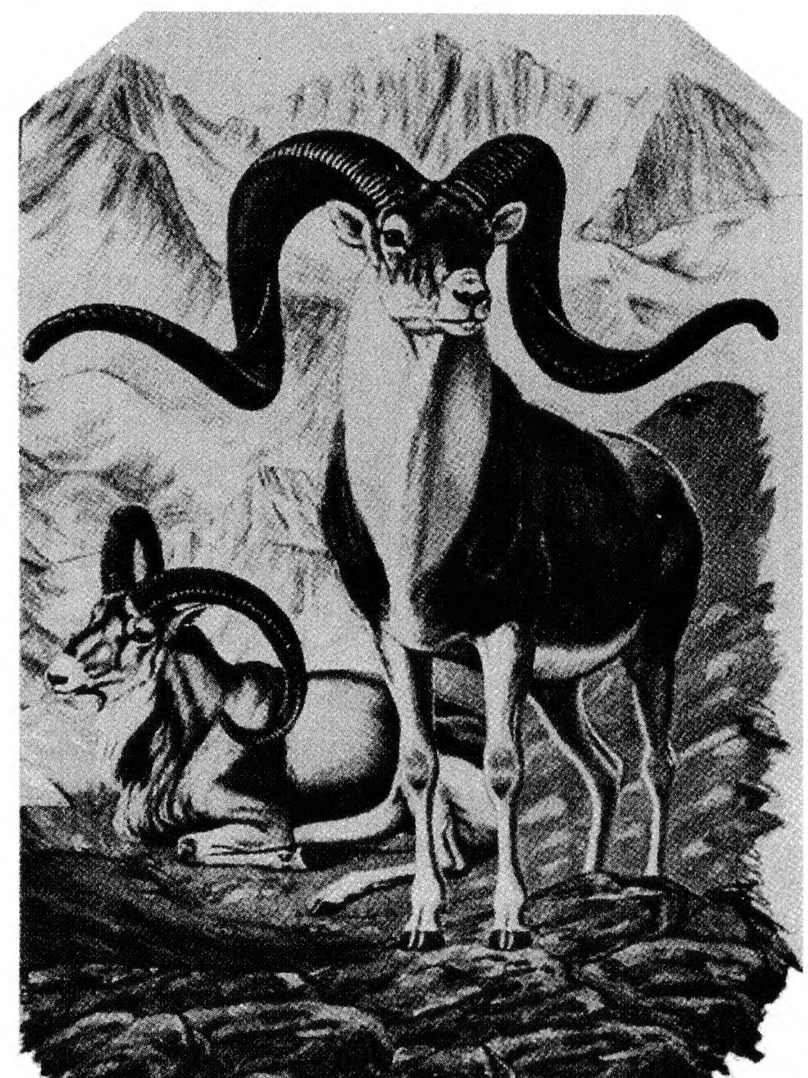
include numerous species of migratory waterfowl and waders that seasonally use Afghanistan's wetlands of Hamun-i-Puzak and Hamun-i-Helmand on the Iranian border, and Ab-i-Estada and Dashte Nawar for feeding, breeding, and rearing their young. Dashte Nawar at 3,210 m elevation is the highest breeding area in the world for the greater flamingo (*Phoenicopteris ruber roseus*). Among Afghanistan's 250 mammal species, there are also many exotic forms that include the caracal cat, leopard, lynx, goitered gazelle, Siberian ibex, urial, and wild goat to mention but a few. A number of the ungulates, in particular the Marco Polo sheep, markhor, and urial, are transboundary species that have seasonal movements to and from Afghanistan and neighboring countries. Their rational utilization and conservation in Afghanistan is vital in terms of maintaining global biodiversity and a healthy state of the regional environment.

Northern Afghanistan forms part of the center of plant diversity for the mountains of middle Asia. In addition, there are many other interesting plant communities in the country, but many have been depleted during the war years. For example, wild pistachio (*Pistachia*) and almond (*Amygdalis*) woodlands have been severely degraded. The maintenance of their gene pool is essential if these species are to be utilized to improve domesticated varieties. The holly oak, cedar, pine forests, and remnant juniper forests of Nuristan and Laghman have undergone unmonitored exploitation in areas close to roads. However, roads penetrate only the periphery of these forested areas, and reliable sources in Afghanistan report that montane forests in these provinces are still in good to pristine condition in the hinterlands. Forests of Paktia Province have perhaps been the most seriously affected during the war and subsequent anti-terrorist activities that are still ongoing. Until the security situation improves, it is unlikely conservation activities can be expanded into this border province in the short term. Among the many important economic plants in the country, cumin (*Carum bulbocastranum*) is one of the principal spices that is exported internationally. The valleys of Badakhshan produce the highest quality cumin in the world and the seeds of this herb have been exported along the ancient Silk Road trade route for thousands of years.

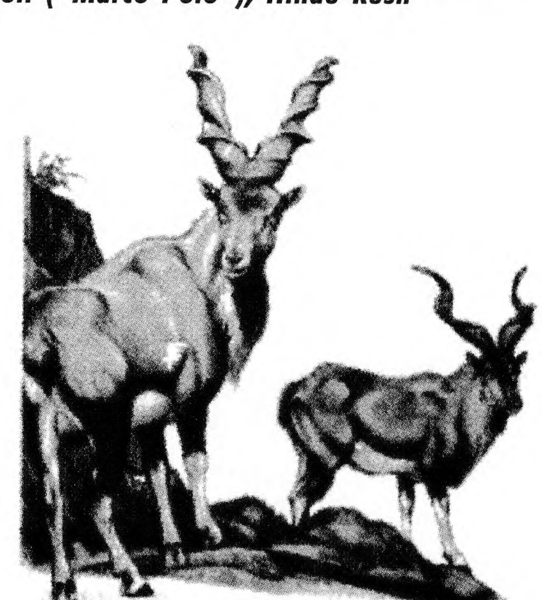
Sustainable use of wildlife resources was being actively practiced by the Afghan Tourist Organization (ATO), one of the primary government agencies active in conservation of natural resources through a tourist hunting and trekking program until the start of the war. For a number of years, ATO had been conducting a hunting program for Marco Polo sheep and ibex in the Big Pamir Mountains in the western part of the Wakhan Corridor. Besides substantial economic returns (12 adult male



Four varieties of Ibex



Ovis Poli ("Marco Polo"), Hindu-Kush



Markhor

Source: Sahab Geographic and Drafting Institute. 1939. *General Atlas of Afghanistan*. Tehran.

wild sheep were hunted annually at a cost of $16,000 per sheep), local people were substantially involved in the hunting program by providing guides, hunters, porters, pack animals, and foodstuffs for which they received considerable economic benefits, besides secondary benefits of medical assistance, clothing, and school supplies for children. The result was that a large reserve of some 68,000 ha, a former royal hunting reserve, was maintained and honored by the local communities where grazing of domestic animals was limited, thus maintaining the natural environment for near exclusive use of wildlife.



Tulibai Valley in the Big Pamir Wildlife Reserve

Alexander the Great and Ghengis Khan, two of Asia's most noted conquerors, failed in their efforts to introduce limited hunting "legislation" among the tribes of ancient Aryana. Modern Afghans are no more agreeable to hunting restrictions than were their forebears. However, survival of the Afghan fur industry depends on the maintenance of adequate stocks of wild predators. To achieve a sustained yield, there must be decreases in the annual kill. Since no hunting legislation exists, these problems could be approached from the marketing end. This can be most effectively achieved by placing an outright ban on all fur exports, clamping down on smuggling, and making it illegal to sell furs of endangered species, including snow leopard, lynx, Blandford's fox, the yellow throated marten, Asiatic cheetah, and caracal.

International involvement in Afghanistan's conservation efforts was initiated in 1971 with independent wildlife conservation studies and efforts centered in the high Pamir Mountains of the Wakhan Corridor. The researchers were subsequently employed by ATO as wildlife consultants and for two years conducted reconnaissance wildlife surveys over much of Afghanistan. The objective was the possible expansion of conservation efforts in the country through community participation in an expanded tourism program focused on sustainable wildlife utilization and other ecotourism programs. Subsequently, the World Wide Fund for Nature (WWF)[9] funded additional surveys, particularly for the greater flamingo, Siberian crane and other waterfowl and water birds in Ab-i-Estada and Dashte Nawar in Ghazni Province.

These efforts and further interest of the Government in expanding its conservation program led to the initiation in 1974 of the UNDP-funded and FAO-implemented Conservation and Utilization of Wildlife Resources Project. Its goals were to ensure conservation and effective management of the country's spectacular and valuable wildlife resources and habitats and to stimulate tourism by establishing a system of national parks and wildlife reserves representative of the various ecological zones of Afghanistan. Subsequently, the Government designated the protected parks listed in Table 4.

The project continued for the following 6 years until political instability and security issues caused its demise. During that time, the Forest and Range Management Department of the Ministry of Agriculture and Irrigation was appointed the responsible authority for wildlife and protected areas management and took a leading role in furthering conservation efforts. It became the major government agency co-directing the UNDP/ FAO project. The Department directed expanded efforts in wetland conservation, and through the project took the lead in conducting additional conservation work in the forested areas of Nuristan and Laghman, the Hazarajat and Pamir Mountains, Hamun-i-Helmand, and the Puzak wetlands on the Iranian border, among others. Twelve sites and an additional three cultural heritage sites were identified as potential components of Afghanistan's protected areas system, covering a range of ecosystems from the high mountains and forested areas in the eastern

9 The World Wide Fund for Nature was formerly known as the World Wildlife Fund; its international headquarters are located in Gland, Switzerland.

Table 4: Designated Protected Areas

Name	Area (ha)	Year	Elevation (m)	Designation	IUCN Category
Dashte Nawar	7,500	1977	3,200-3,210	Waterfowl Sanctuary	IV
Pamir-i-Buzurg	67,938	1978	3,250-6,103	Wildlife Reserve	IV
Ab-i-Estada Proposed National Park	27,000	1977	1,950-2,100	Waterfowl Sanctuary	IV
Ajar Valley Proposed National Park	40,000	1978	2,000-3,800	Wildlife Reserve	IV
Bande Amir	41,000	1973	2,900-3,832	National Park	II
Kole Hashmat Khan	191	1973	1,792-1,794	Waterfowl Sanctuary	IV

Source: UNEP World Conservation Monitoring Centre.

part of the country to the wetlands of the southeast and central parts of the country (see Table 5). Additionally, in 1973 ATO succeeded in securing government approval for Afghanistan's first national park in Bande Amir (41,000 ha), and in the same year, the country also acceded to the Ramsar Wetland Convention.

Table 5: Proposed Protected Areas

Name	Area	Elevation (m)	Proposed Designation
Nuristan	TBD	4,876-6,293	National Park
Darquad (Takhar) Wildlife Management Reserve	TBD	2,000-4,000	TBD
Imam Sahib (Kunduz) Wildlife Management Reserve	TBD	1,900-2,095	TBD
Hamun-i-Puzak	35,000	1,620-1,731	National Park
Registan Desert Wildlife Management Reserve	TBD	800-1,200	TBD
Northwest Afghanistan Managed Reserve (Badghis)	TBD	1,200-2,000	TBD
Bamiyan Buddha Complex (cultural heritage site)	TBD	unknown	National Park
Zadran (cultural heritage site)	TBD	unknown	National Reserve
Khulm Landmark (cultural heritage site)	TBD	unknown	Protected Area

Notes: IUCN categories have not yet been assigned.
TBD-to be determined.
Source: UNEP World Conservation Monitoring Centre.

After 1979, all conservation work came to an abrupt halt and pending proposals for an expansion of the nature reserve system in Afghanistan could not be realized. Afghanistan's natural resource base and environment has undergone extensive deterioration over the past two decades as a direct result of wars, political instability, intensive natural resource exploitation, and recent widespread drought that has affected many parts of the country. Environmental conservation has remained at a relative standstill since then and the exploitation of natural resources, in particular the country's meager forests, have continued unabated. The few government institutions that existed to conserve the natural heritage of the country were rendered ineffective by the military conflict. Traditional conservation knowledge has been on the decline and a massive exodus of professionals from the country has left Afghanistan with few intellectuals and experienced technocrats to implement conservation activities.

In 1995, the Society of Afghanistan Volunteers for the Environment (SAVE), an Afghan nongovernment organization (NGO) formerly based in Peshawar, initiated additional surveys in the Ab-i-Estada and Dashte Nawar wetlands, and later did snow leopard surveys in the Wakhan district with the assistance of WWF-Pakistan. Save the Environment-Afghanistan (SEA) replaced SAVE in 1998 and has since conducted a number of conservation programs that include community awareness and mobilization for environmental protection, reforestation, and forest monitoring.

Presently, the lack of environmental protection combined with a burgeoning human population dependent upon a declining natural resource base has driven many species of plants and animals to the brink of extinction. As an illustration, aid workers and soldiers from the International Security Assistance Force (ISAF) are con-

tributing to the extinction of snow leopards by buying their pelts for $1,500. Despite an international ban on the trade, pelts are sold openly in stores in Kabul. There are estimated to be fewer than 100 snow leopards left in Afghanistan and about 3,500 in Central Asia. Afghans faced with drought that has gripped the country for the last four years have resorted to killing the snow leopard's prey. Hunters are also selling the bones of the snow leopard for their alleged aphrodisiac and healing properties in Chinese traditional medicine.[10] Policy should be urgently enacted banning the sale of the pelts. Communities in snow leopard habitats should be provided incentives and empowered in their traditional role of guardians of their lands.

Seventy-five species of animals and plants found in Afghanistan have been placed on the IUCN Red List with 35 species of animals listed as either vulnerable or endangered. The total number of threatened species is certainly much higher, as essentially no wildlife research has occurred in Afghanistan in many years.

The ITGA ratified the Convention on Biological Diversity on August 15, 2002. Apart from the assessments mentioned above and some collaboration with the International Board for Plant Genetic Resources concerning documentation of local grain varieties, it has been many years since the country has actively engaged itself in global or regional cooperation relating to biodiversity conservation and protected parks management.

Desertification

By many accounts, the process of desertification is already advanced in several areas of Afghanistan's arid north, west, and south. The severe drought of the past four years has been exacerbated by the adverse effects of the conflict on resource management patterns. The near total lack of data indicating trends in land conditions makes it extremely difficult to assess the locations and degrees of threat represented by this phenomenon. Nevertheless, the topic deserves special attention as environmental management efforts in the country begin in earnest. Afghanistan signed the Convention on Combating Drought and Desertification on January 11, 1995.

Pollution and Environmental Health

Urban and Industrial Pollution

Urbanization in Kabul and Herat—and to a lesser extent in Mazar-i-Sharif, Kandahar, and other cities—is currently taking place in an almost totally haphazard fashion. This disorganized process is making it virtually impossible for the municipalities to plan for and provide even the most rudimentary environmental services, such as solid waste management, drainage, protection of groundwater supply and quality, household and commercial wastewater management, piped water supply, air pollution control, and urban zoning or land-use planning.

Solid waste management has come almost to a standstill. Disruptions from the war, including damage to collection trucks, and a lack of funds for workers' salaries and fuel has brought the system to near collapse in most municipal settings. In Kabul, for example, garbage is being disposed of in informal dumps around the city, and there is only the most rudimentary collection service. Some government agencies and NGOs have been assisting by providing fuel or food in exchange for work by municipality laborers, but this system is not sustainable in the absence of a direct cost recovery mechanism or some other source of municipal revenues.

A busy scene in Kabul where large numbers of returnees are straining available resources



10 Harrison, David. 2003. Afghan Leopard Faces Extinction as Aid Workers Buy Pelts. *The Telegraph*. January 5. Available: http://www.telegraph.co.uk/news.

Issues relating to water resources management, including some of those associated with urban and industrial use, already have been discussed. Where the infrastructure of municipal water supply, drainage, and wastewater collection and treatment existed prior to the conflict period, it generally is in need of rehabilitation. In other areas such infrastructure must be planned and built for the first time. Such measures should greatly reduce the prevalence of health problems from water-borne diseases. This should be of high concern, since Afghanistan has one of the highest child mortality rates in the world—primarily because of diarrheal diseases. Though it will be challenging under the economic conditions prevalent in Afghanistan, it will be advisable to follow full cost recovery and user pays principles wherever feasible (while still ensuring that water is available to meet the basic needs of the poor) so that neither the national nor local governments become saddled with high recurrent costs for operation and maintenance of water-related services.

Outdoor air pollution is increasing in Kabul and several other urban areas, largely from vehicular emissions. Kabul's air quality problems are exacerbated in the winter months when the city is prone to atmospheric inversion. Programs for the management of traffic flow and control of vehicular emissions need to be established in advance of the increased traffic that will come with redevelopment. Indoor air pollution also is a potential source of health problems, especially associated with stoves used in the winter months when there is poor ventilation indoors. It is as much a rural as urban phenomenon, though the latter can be expected to decrease as kerosene and other fuels become more widely affordable in urban areas. As stated earlier, Afghanistan ratified the UN Framework Convention on Climate Change (UN FCCC), bringing the country into international dialogue and enhancing the possibility of grant resources being made available for simultaneously addressing local air pollution problems and greenhouse gas emissions.

As noted, urban zoning or land use planning is virtually non-existent. The refugee influx is creating enormous pressures on cities to provide adequate services, and this is made even more difficult by the lack of spatial planning or enforcement of even rudimentary zoning requirements. For example, encroachment on fertile agriculture lands immediately adjacent to cities is threatening to drive up the cost of providing urban areas with food supplies, reducing green space and displacing an important source of sustainable income and nutrition, especially from production of high value crops such as vegetables. Careful attention also should be given to the location of industries, with the preferable approach being to co-locate those with similar waste products—particularly small and medium-scale enterprises—so that they can cooperate in waste reduction or treatment measures. Also, companies can be co-located to promote waste exchange—in which the by-product of one company is used as an input to another company.

The mining and energy sectors also present special environmental management challenges. As these sectors are redeveloped, care must be taken to ensure that a wide range of exploration, exploitation, and distribution options are considered to minimize adverse environmental impacts. Oil, gas, coal, marble, and other mining activities as well as pipelines and hydropower dams can bring significant economic benefits to the country, but this should not be done at the expense of social, cultural, or environmental concerns. Afghanistan acceding to the UN FCCC also opens up new possibilities for development of greenhouse gas reduction activities under the Clean Development Mechanism in the energy sector. This may offer additional incentives for the essential development of renewable energy resources such as the establishment of sustainable fuelwood lots and use of other biomass energy sources as well as solar power, wind power, microhydro, and biogas options.

Agrochemicals

The use of agrochemicals (fertilizers, insecticides, herbicides, and fungicides) has been promoted by government and donor-funded agricultural projects in response to the need to increase staple food crop and horticultural production. The handling, application, storage, and transport of agricultural chemicals, particularly insecticides and herbicides, pose significant environmental and health challenges, which will increase as agricultural activity intensifies. Appropriate incentives and safeguards, especially to protect children from adverse exposure to insecticides, should be established and maintained.

Insecticides have been used in Afghanistan for many years, especially for locust control in the northern provinces. Of particular concern is the use and storage of BHC, a highly persistent chemical insecticide previously supplied by the former Soviet Union for the eradication of locusts. It is now banned in all countries. As of 1992, there were approximately 7 million kilograms of BHC in paper bags improperly stored in various locations around the country that require containment and disposal. There is concern that BHC use may be tempting for control of the latest locust infestation if alternatives are not made available. Afghanistan has not yet availed itself of any external assistance with regard to the management of



Landmines and chemical residues from years of war endanger farmers

persistent organic pollutants (POPs), the international management of which is now covered by the Global Environment Facility.

Residuals of Warfare

Certain regions of Afghanistan were subjected to intensive attack by chemical weapons during the conflict with the former Soviet Union. Between 1979 and 1981, chemical attacks reportedly killed more than 3,000 people. Unfortunately, there is no information available as to the persistence of toxins in soil, vegetation, and animal tissues. Investigations are warranted into the safety of these areas for people and livestock, for example through exotoxicology assays.

In the aftermath of widespread bombing of targets across the country, it is necessary to assess the contaminants released, associated toxicological and radiological risks, and mitigation measures.

There also are unconfirmed reports of radioactive wastes in the deserts of the south left over from the period of Soviet occupation, and these need to be investigated and dealt with appropriately.

The country also is littered with landmines—representing one of the greatest humanitarian and development challenges to be overcome in the reconstruction process. These landmines have not only caused suffering for the human population and resulted in the loss of wildlife, but they also have destroyed hundreds of irrigation systems. Landmines accelerate environmental damage through their explosions, but the fear of mines also drives herders, villagers, and others from productive areas thought to be mined into more marginal and fragile environments—speeding the depletion of resources and destruction of biological diversity.

CHAPTER I

INTRODUCTION

Background

This report provides perspectives on the most significant environmental issues currently facing Afghanistan as it emerges from years of conflict and isolation, and also recommends a set of approaches to address the highest priority problems identified. It is based on a needs assessment exercise undertaken by the Asian Development Bank (ADB), the United Nations Development Programme (UNDP), and the World Bank. A Preliminary Needs Assessment (PNA) was conducted during December 2001 to assist the Afghan Interim Authority (AIA) with the identification and programming of high priority reconstruction and development activities across all sectors. The PNA outlined strategic choices for the country's redevelopment and presented these in a prioritized manner to the donor community with indicative funding requirements, including immediate needs (first year), short-term options (2 years) and long-term development initiatives (10 years).

The PNA exercise was finalized in January 2002 after further consultations with Afghan civil society representatives in Islamabad and members of the AIA in Kabul. The final PNA report was presented at the Ministerial Meeting of the Afghan Reconstruction Steering Group in Tokyo from 20 to 21 January 2002 and helped to form the basis for international assistance commitments to Afghanistan of some $4.5 billion.

Environment Sector Needs Assessment

At the Tokyo Ministerial Meeting it was agreed that missions would be organized and undertaken to prepare Comprehensive Needs Assessments (CNAs) for each of 18 sectors relating to Afghanistan's recovery and reconstruction. Accordingly, a multi-donor Environment Mission[1] visited Afghanistan from 16 to 28 March 2002 to conduct a detailed needs assessment leading to a CNA for the environment sector. The objectives of the Environment Mission were to ascertain the needs of Afghanistan in the environment sector and to gain an indication of donor support for environmental aspects of the urgent priorities identified in the PNA report. As in the case of other CNA efforts, the aim of the Environment Mission and subsequent environment sector analysis was to produce a program owned by the Islamic Transitional Government of Afghanistan (ITGA) and adhered to by the donors so that both external and internal financing can be channeled in a coordinated fashion—especially to avoid overburdening the limited implementation capacity of the ITGA.

The Environment Mission consulted with key stakeholders to produce a preliminary framework for the environment sector comprising a policy and institutional framework and a set of interim donor coordination arrangements; and proposed technical assistance for near- and medium-term implementation. This report on Afghanistan's environment in transition builds on the work of the Environment Mission and provides an expansion of these elements as the basis for coordinated action to address high priority environmental concerns in Afghanistan.

1 The Mission was led by ADB, and comprised: Ali Azimi of ADB as mission leader; Stefan Micallef and Purna Rajbhandari of the United Nations Environment Programme (UNEP); and Kjell Esser of the Norwegian Agency for Development Cooperation. David McCauley, an ADB staff consultant, also assisted with preparation of this report, and Ronald Petocz contributed to the section on biodiversity conservation and protected areas management.

CHAPTER III

DEVELOPMENT FRAMEWORK FOR THE ENVIRONMENT SECTOR

Policy Framework

Interim development objectives have been adopted by the ITGA and are reflected in its aspiration to see international humanitarian and development assistance become an instrument for reducing poverty, reestablishing national sovereignty and unity, and laying the foundation for the country's sustainable prosperity. To achieve these objectives, the AIA proposed in its mid-2002 Draft National Development Framework three pillars of development strategy.[11] These are to (i) use humanitarian assistance and social policy to create the conditions for people to live secure lives and to lay the foundations for the sustainable formation of human capital; (ii) use external development assistance to build the physical infrastructure needed to lay the basis for a private sector-led strategy of growth supporting the formation of human and social capital; and (iii) to create a competitive private sector that becomes the engine of economic growth and an instrument of social inclusion through creation of opportunity.

The Government has taken the decision to establish Consultative Groups (CGs) within which the national budget will be planned, financed, and implemented. Each Consultative Group is expected to focus on the attainment of specific benchmarks in the areas of policy development and institutional reform and the programming, implementation, and monitoring of specific national programs. Consultative Groups will create the enabling environment for enhanced government-donor interaction and coordination of efforts.[12]

Environment will be mainstreamed where feasible into each program area and reflected in the national budget exercise. An *Advisory Group* will be established to assist in mainstreaming environment into each CG as well as report to the CG Standing Committee and ultimately the Afghanistan Development Forum. ADB and UNEP have been designated as the focal points for environment.

Unfortunately, Afghanistan is starting from an extremely low base with regard to its policies for management of natural resources and protection of the environment. While this presents enormous challenges, it also allows the country to design a policy framework fully responsive to national aspirations and needs. Policymakers also can take advantage of the many lessons available from international experience in this field applicable to helping the country establish a firm basis for its sustainable development.

One such lesson is that economics and environmental management go hand-in-hand. Sound management of natural resources and environmental protection directly underpin the basis for sustainable economic growth and long-term social welfare. The subject of environmental management is not a luxury to be considered only after the country's infrastructure and economy are rebuilt, but rather it is central to the strategy for achieving sustainable prosperity for the people of Afghanistan.

11 Afghan Assistance Coordination Authority. 2002. *National Development Framework (Draft for Consultation)*. Kabul.

12 Afghan Assistance Coordination Authority. 2002. *The Establishment of Consultative Groups for Furtherance of the National Development Programme (draft)*. Kabul.

Given the country's extremely scarce financial and human resources for environmental management, it is vital that policies and programs in this sector be efficient as well as effective. For environmental policies to be effective, they require capable public institutions—presently a scarce commodity in the country. Enacting comprehensive legislation is of limited value in the near term if institutions are incapable of overseeing their implementation and taking actions to address high priority environment problems. Because environmental issues cut across sectoral boundaries and may involve a number of different agencies, it is vital that institutional arrangements be clearly delineated from the outset. Where possible, priorities for natural resource management actions should be established based on their estimated net benefits to society. Likewise, interventions to avoid environmental damage from wastes should take cost effectiveness and efficiency into account. Principles of market pricing for natural resources, such as "user pays," "polluter pays," and "full cost recovery" should be followed whenever feasible. Opportunities to directly contribute to poverty alleviation and support the basis for community livelihoods also should figure prominently in the prioritization of policies and programs. Certain actions—such as diversity conservation or reduction of greenhouse gas emissions—may additionally be justified by the global benefits they generate.

In the short run, the ITGA must rely in part on the adherence of external assistance agencies to their own environmental policies that guard against adverse environmental impacts from relief and reconstruction efforts. At a minimum, a fundamental legislative basis for environmental policies and institutional structures needs to be created as soon as possible. Emphasis should be placed primarily on the use of economic incentives to positively shape environmental behavior rather than attempting to create a cumbersome command-and-control regulatory structure, though no set of environmental policies will be enforceable in the absence of at least rudimentary rule of law.

Environmental Governance

The ITGA has set as its central goal the reestablishment of central government legitimacy to facilitate economic, political, and social affairs and establish the rule of law. Protection of the populace from pollution and the restoration of productive but sustainable natural resource management patterns are fully consistent with this endeavor. It is critical that the public be engaged in formulation of environmental policy and be empowered to express its concerns in the environmental assessment of programs and projects. Public scrutiny should be made an integral part of the decision-making process. The ITGA's policy document[13] envisions a process for developing a national community empowerment program, called "National Solidarity," that will deliver a series of block grants to communities to enable them to make decisions in a participatory manner on their key priorities.

With a new constitution being drafted after two decades of war, fundamental questions have arisen about the structure of the future Afghan state. The degree of centralization versus decentralization lies at the core of this debate. Advocates of decentralization argue that the ethnification of the conflict over the past decade has led to strong regional identities, so that the only viable solution is to establish a federal structure that grants full autonomy at the provincial level with real power remaining in the hands of the regions.[14]

Against this backdrop, the development of government institutional capacity for environmental management must, of necessity, begin with national authorities and later spread to municipalities, and provincial and local governments. Initially, this can be built up around a core capacity for the oversight and monitoring of the environmental impacts of humanitarian and development projects. The creation of a department within the Ministry of Irrigation, Water and Environment with these responsibilities is probably the best short-run approach. This unit will serve as the focal point for environmental affairs and thereby for coordination of donor activities relating to the environment. It will be responsible for establishing and overseeing an interim policy and programming framework for the environment sector, which can serve as the embryo for developing broader environmental management capacity within the ITGA as institutional strengthening efforts move forward.

13 Afghan Interim Administration. 2002. *Draft National Development Framework*. Kabul.

14 Azimi, A. 2001. Autonomous Regions for Afghans. *International Herald Tribune*. November 6. Available: http://www.iht.com.

CHAPTER IV

WORK PLAN FOR SECTOR PLANNING AND CAPACITY BUILDING

Short Term

Refinement of Interim Policy and Programming Framework

The results of the short-term technical assistance activities summarized below, coupled with broader ongoing capacity development within the central Government, should provide the basis for a gradual refinement of the interim policy and programming framework.

Over time, careful choices will need to be made concerning policy mechanisms employed to achieve environmental and natural resource management objectives. As noted, there are ample lessons to draw upon from international experience, though these obviously must be adapted to the special circumstances of Afghanistan. Given that the country is not starting with a command-and-control system of regulatory authorities governing the behavior of resource users or polluters, it may be sensible to emphasize the use of policy tools relying on economic incentives to achieve environmental management goals, especially if they also can generate much needed revenues.

As noted, no specific environment-related project investments are anticipated in the short run other than those to be incorporated into the programs of related sectors such as agriculture, natural resources, energy, water, and sanitation. However, several high priority short-term technical assistance activities are identified below. These are envisaged to be grant-financed and to directly complement sectoral investments.

Coordination of Relief and Development Assistance

The strong links between patterns of refugee and IDP resettlement and environmental management also have been noted. Even if the environmental impact assessment procedures of all external assistance agencies are fully followed for individual projects, there will still be the risk of inconsistencies and unanticipated adverse cumulative environmental impacts. This underscores the need for coordination between humanitarian relief and economic reconstruction activities for sectoral and regional assessments of environmental impacts that go beyond project-level analysis. It is anticipated that both the AACA and Ministry of Irrigation, Water and Environment will carry out these functions, and the environment department should give attention to these coordination matters. Appropriate interactions with NGOs and other groups representing stakeholder interests will be an essential element of this approach.

Long Term

Policy and Institutional Framework Development

Short-term emphasis is placed on establishing a basic set of governmental policies and associated institutions at the national level, while including the voice of affected communities to the maximum extent feasible. In the long term, these efforts will need to be expanded "horizontally" to include a much wider range of

stakeholders at the national level and "vertically" to more fully engage provincial and local governments as well as river basin organizations and a host of other governmental and quasi-governmental institutions directly involved in environmental and natural resource management. Much wider engagement on these subjects also will be needed from the legislative and judicial branches of government. Active efforts will be required to consult with and involve NGOs, community and religious groups, the media, resource user associations, and the private sector.

Further technical assistance will be programmed based on the outcomes and outputs of short-term activities as well as the findings and results of work in the natural resource and other environmentally-related sectors. It is premature at this stage to suggest resource requirements to support this process, but the main objectives should be clear. Over a 10-year timeframe, further capacity-building efforts are expected to lead to the establishment of policies and institutions to carry out at least the following functions:

- establishing and updating broad-based national environmental and natural resource management strategies and policies;
- incorporating environmental considerations into national and regional economic planning;
- organizing national participation in and compliance with multilateral environmental agreements;
- setting minimum national environmental standards for certain types of behavior and/or ambient environmental quality;
- monitoring the status of key natural resource systems and environmental quality indicators; and
- taking responsibility for management of specific natural systems, such as lands, forests, aquatic systems, natural protected areas, and mineral resource exploitation.

While these functions center primarily on the responsibilities of government institutions, the further development of active and positive roles for NGOs, community and religious groups, the private sector, the media, and other elements of civil society will be essential.

Mainstreaming Environmental Considerations into All Sectors

Experience in the developing world with the creation of central environmental ministries has been somewhat disappointing in terms of establishing firm oversight authority and effective environmental policy leadership. These same risks exist for Afghanistan if the initial institutional effort centers on creating and strengthening an environment department within the Ministry of Irrigation, Water and Environment. Measures can and should be taken to encourage the "mainstreaming" of environmental considerations into the thinking and action of all sectors, even in the short run, and this is a very important longer term goal for policy and institutional development. Whenever possible, emphasis should be placed on strengthening the capacity of all line departments/ministries to understand and act upon the most important environmental dimensions of their sector. This will require very different skills from those traditionally represented within these agencies, including the ability to work effectively with local communities and an understanding of both applied ecology and environmental economics to aid the planning process. In a break with the past, the mindset that defines environmental controls as useless burdens on sectoral development activities should be replaced with a perspective that views waste reduction, community engagement in program planning and implementation, and other such measures as making positive contributions to efficiency and development effectiveness.

CHAPTER V

SHORT-TERM TECHNICAL ASSISTANCE PLAN

Eight short-term technical assistance actions are identified to serve as complements to project investments. In many cases these activities are designed to make use of grant financing associated with multilateral environmental agreements.

Establishing Capacity for Implementing Environmental Safeguards

Purpose and Approach. Policies and institutional capacity within the ITGA will be established to provide adequate oversight and monitoring of the environmental impacts of humanitarian and development projects. It is assumed that this will be accomplished through the creation of a department within the Ministry of Irrigation, Water and Environment supported by short-term training for related capacity building. This department will serve as the focal point for environmental affairs within the ITGA and thereby for coordination of donor activities relating to the environment; in time it also can play a broader role in efforts to develop environmental management capacity within the Government.

Background and Justification. As the ambitious relief, recovery, reconstruction, and development program takes shape, the ITGA will need to ensure that both external assistance agencies and the private sector follow established norms with respect to the full incorporation of environmental considerations into the design and implementation of projects.[15] For the most part, it can be assumed that aid agencies have and will adhere to adequate internal environmental safeguard policies, but there is at a minimum a need for monitoring capacity within the Government. Environmental assessment norms include procedures for public consultation in project design, and the ITGA may also need to play a role in encouraging and facilitating such participation consistent with the principles laid out by the AACA in the Draft National Development Framework. The Government's vision for the country's redevelopment also is private sector-driven, anticipating the attraction of investment according to Afghanistan's international competitive advantage. There is a need to establish appropriate environmental safeguard policies governing this investment. As the number of projects increases, cross-cutting analyses of the environmental impacts of these investments will be needed at the regional and sectoral levels to avoid adverse cumulative effects on the environment to support environmental planning and interagency coordination.

Environmental Information Development

Purpose and Approach. There is an immediate need for the assessment and compilation of available data on

15 The same can be said for social and other safeguards, though environmental assessment procedures are probably the most common and accepted. Consideration should be given to linking the government's oversight capacity for environmental and social safeguards, as this would also conform to development aid agency norms.

Afghanistan's environment, working with appropriate national, provincial, and local entities as well as international data sources. Development of baseline information should include, but not be limited to, remote sensing data utilizing a Geographic Information System (GIS) for data organization covering land use, forest cover, rangelands, wetlands, and other data sets. An evaluation of resource management and environmental quality trends will be conducted to the extent possible, and a baseline database will be established to support such analysis in the future. This environmental information development activity will produce a transparent, consistent, and commonly accessible (preferably Web-based) source of information to support project-level environmental assessments and broader policy and program planning.

Background and Justification. In the past, there was a well-balanced system of human-environment interactions comprising a sustainable—if basic—way of life based on natural resource endowments and encompassing a set of evolved social relationships. As a result of the conflict over the past 24 years, this balance has not only been upset, but virtually destroyed. There presently is no baseline information available on natural resources to assess environmental and natural resource management conditions and trends, to set policy and program priorities, and to otherwise serve as an important tool to aid the incorporation of environmental considerations into development activities. Data on Afghanistan's natural resources and environmental conditions are neither accurate nor available, as there have been only the most rudimentary of information collection and monitoring efforts over the past 20 years. This information is essential to the development and implementation of a long-term plan to rehabilitate and conserve Afghanistan's natural resources as the basis for sustainable community livelihoods and conserving the country's natural heritage.

Environmental Management Capacity Building Needs Assessment

Purpose and Approach. A broad-based needs assessment will be conducted to evaluate the current capacities of all government agencies, private sector, NGOs, and academic institutions with respect to environmental and natural resource management skills and experience. The subject areas to be assessed include the gamut of topics covered in this report, including resource sectors (water, forests, rangelands, biodiversity), pollution management, cross-cutting topics (e.g., climate change, desertification, community participation, and environmental monitoring), and analytical fields (such as environmental economics, conservation sciences, environmental impact assessment, spatial analysis/GIS, and gender analysis). The assessment will specifically identify opportunities for development of undergraduate and graduate programs in ecology, conservation, resource management, and other areas related to scientific needs in sustainable development at Kabul University as well as providing limited quantities of appropriate research materials and upgrading the research library with books and journal acquisitions.

Background and Justification. Given the very low base of available environmental management skills in the country, a broad-based assessment of current capacities is warranted to serve as the foundation for an institutional strengthening effort to be conducted in this field. Most of the other activities anticipated in the environment sector hinge on the completion of this analysis and the initiation of at least early capacity building efforts based on its recommendations.

Sustainable Water Resources Management

Purpose and Approach. A broad-based national water management policy and institutional structure for its implementation will be developed to serve as a mechanism for coordination and facilitation of investments in this sector. The policy will cover surface as well as groundwater management and both water quantity and quality issues in as integrated a fashion as is feasible. To the extent practical and applicable, the policy should adopt an integrated river basin management approach and should help to set priorities for all water-related investments. As a result of this process, a stand-alone water quality management strategy will be developed with the possibility of an associated national water quality laboratory to facilitate monitoring and auditing. Special attention should be given to finding proper balance between the roles of government entities, the private sector, and water user associations in the management of water systems. The special social, cultural, and religious sensitivities in Afghanistan regarding water rights and allocation mechanisms also

should be taken fully into account. This analysis will fill that gap.

Background and Justification. Afghanistan's water resources management infrastructure and institutions have been devastated during the period of conflict. In response, wide-ranging investments in the rehabilitation and development of Afghanistan's water resources management systems are expected over the next few years. However, none will have the breadth of coverage to adequately consider the water sector in an integrated fashion and from a national perspective.

Sustainable Forest Management

Purpose and Approach. A preliminary analysis of the state of the nation's forests and the principal factors contributing to their degradation will be conducted. Recommendations for their sustainable management will be derived within an appropriate policy and institutional framework. These recommendations will pay particular attention to the identification of collaborative forest management opportunities capable of enhancing the sustainable livelihoods of communities living within or adjacent to national forests. This effort should be coordinated with the emerging investment agenda with respect to forest sector rehabilitation and watershed management as well as policies governing water, rangelands, and protected ecosystems. Carbon sequestration options that may offer Afghanistan the chance to generate greenhouse gas emission reduction credits also will be explored. Special attention should be given to finding proper balance between the roles of government entities, the private sector, and forest-based communities with due consideration to traditional patterns of sustainable forest management in Afghanistan that may be revived. Pilot demonstrations of promising social forestry and agroforestry forest regeneration and management approaches should be designed and may be supported as part of this activity.

Background and Justification. Afghanistan's forest resources and institutions were devastated during the period of conflict. In response, investments in the rehabilitation of watersheds and forest areas are expected over the next few years. This analysis will prepare a preliminary policy and institutional framework to consider these investment options in an integrated fashion and from a national perspective. Quick action to encourage forest regeneration and replanting can help to restore ecological balance in critical watersheds while generating short-term employment opportunities.

Sustainable Rangelands Management

Purpose and Approach. A preliminary analysis of the state of the nation's pastoral lands and the principal factors contributing to their degradation will be conducted. The carrying capacity of various rangeland systems will be assessed in a preliminary manner, and the specter of desertification also will be examined to estimate its real dimensions as they relate to rangelands management. The results will be used to estimate sustainable livestock populations and contribute to rangeland management plans within an appropriate policy and institutional framework. This effort should be coordinated with the emerging investment agenda with respect to animal husbandry and rangelands development as well as policies governing water, watersheds, forests, and protected ecosystems. Carbon sequestration options that may offer Afghanistan the chance to generate greenhouse gas emission reduction credits also will be explored. Special attention should be given to finding proper balance between the roles of government entities, the private sector, and pastoral communities with due consideration to traditional patterns of sustainable rangelands management in Afghanistan that may be revived.

Background and Justification. Afghanistan's pastoral lands and associated institutions were severely degraded during the period of conflict. In response, investments in the restocking and regeneration of rangelands are expected over the next few years. This analysis will prepare a preliminary policy and institutional framework to consider these investment options in an integrated fashion and from a national perspective. Quick action to encourage pastoral land regeneration can help to restore ecological balance in critical watersheds while generating short-term employment opportunities.

Renewable Energy Development

Purpose and Approach. Enabling activities leading to the development of Afghanistan's abundant renewable energy resources as well as programs to promote energy efficiency will be undertaken. This will include the possible pilot-scale testing of promising concepts. The analysis will cover the potential for deriving power from solar, wind, biogas, and micro-hydro sources as well as the use of solar powered water purification systems and water pumping. Workshops on these technologies as well as

energy efficiency measures will be conducted. Specific opportunities for the generation of greenhouse gas emission reduction credits under the Clean Development Mechanism will be explored. This effort should be coordinated with the emerging investment agenda with respect to the energy, water, forestry, and agriculture sectors. Special attention should be given to finding proper balance between the roles of government entities, the private sector, and local communities in the development of renewable energy options for the country.

Background and Justification. Afghanistan is rich in renewable energy resources. The mountains of the country, particularly in the north, offer tremendous untapped hydropower potential, though environmental and social safeguards would need careful application if it is to be developed. In the southeast and southwest, wind resources are abundant. Given the extent of desert lands and remote communities, the country as a whole also has one of the world's highest potentials for tapping solar power. Biomass is traditionally used throughout the country as an energy source largely in the form of fuelwood, charcoal, and animal wastes. It is anticipated that pressures on the nation's limited power generation capacity as well as deforestation can be reduced through the development of alternative energy sources.

Protected Areas Management

Purpose and Approach. Primarily based on an assessment of existing gazetted and proposed parks and protected areas (national parks and wildlife reserves and sanctuaries), a preliminary analysis of the state of these protected areas and the major challenges and opportunities facing their management will be conducted. Recommendations will be derived regarding the possible establishment of a formal system of parks and protected areas within an appropriate policy and institutional framework. These recommendations will pay particular attention to the identification of collaborative management opportunities capable of enhancing the sustainable livelihoods of communities living within or adjacent to these protected areas as well as raising broader revenues. This effort should be coordinated with the emerging policy framework and investment agenda for forest sector rehabilitation and watershed management as well as policies governing water and rangeland management. Carbon sequestration options that may offer Afghanistan the chance to generate greenhouse gas emission reduction credits will also be explored. Special attention should be given to finding proper balance between the roles of government entities, the private sector, and communities traditionally dependent upon these areas for their livelihoods.

Background and Justification. Though Afghanistan's parks and protected areas are currently in a state of almost total neglect, there are some candidate sites for incorporation into a national system (see Table 5 in the Biodiversity/Protected Areas section above). Investments in the rehabilitation of watersheds and forest areas are expected over the next few years, and these should be carefully coordinated with renewed attention to parks, reserves, and wildlife sanctuaries. Assuming that the ITGA signs and ratifies the Convention on Biological Diversity, this will open up the country to full regional and global cooperation in this sphere. Once peace returns to the country, there is potential for developing trekking parks of international significance such as those in Nepal, India, and Kenya. The revenues generated from visitors can contribute to the conservation and effective management of the country's spectacular wildlife and scenic resources as well as supporting local communities around these areas.

CHAPTER VI

DONOR COORDINATION

As indicated in the previous section, high priority should be given to programming technical assistance to help establish policies and institutional capacity within the ITGA for adequate oversight and monitoring of the environmental impacts of humanitarian and development projects. If this is accomplished through the creation of a department within the Ministry of Irrigation, Water and Environment, this unit can serve as the logical focal point for environmental affairs within the ITGA and an interim donor coordination mechanism for environmental matters. It also may be prudent to consider the formation of a national inter-sectoral "environment council"—or even a cabinet sub-committee on this subject—to meet on a regular basis and assist with this coordination process.

ADB continues to offer itself as the lead donor institution in this sector, and it supports the concept of creating an environment department within the Ministry of Irrigation, Water and Environment to represent the ITGA's interests in this regard. A technical assistance grant from ADB to support this objective already has been internally approved, including introducing renewable energy, and it awaits final agreement with the ITGA on the activity's scope and implementation arrangements.

Each of the short-term technical assistance concepts given above includes explicit attention to and suggestions for measures to ensure strong coordination among both the ITGA sectoral authorities and the donor agencies providing assistance to relief, reconstruction, recovery, and development programs. In time, a national environmental and natural resource management strategy exercise, led by the ITGA, is expected to fully engage the donor community to ensure adequate coordination.

Those involved in this planning and coordination exercise express their deep appreciation for the guidance provided by the Afghan Interim Authority (AIA) and the the ITGA throughout this process, particularly through the Afghan Assistance Coordination Authority (AACA), and for the cooperation and assistance of the line ministries and others who have provided information and guidance. This is meant to be a living document subject to refinement as comments are received and the extremely weak database on Afghanistan's environmental resources is improved. Peer review is ongoing, and comments are welcome. Due to the limitations of time and information, this document is certainly not comprehensive in its coverage. It is hoped, however, that it will serve as a useful reference and starting point for the coordination of sorely needed environmental assistance to Afghanistan.

Afghanistan's Environment

Afghanistan's population of roughly 23.5 million is largely dependent upon the country's natural resource base for its economic well being. These resources have been severely degraded as a consequence of past political instability and weakly implemented environment and resource management policies. To remedy the situation, both short-term measures to address immediate needs and a long-term plan will need to be developed and executed to rehabilitate and protect the natural resource base while providing the country's people with the means for their livelihoods through sustainable resource use.[2]

Afghanistan is a landlocked country whose geography and natural resources share many characteristics with its Central Asian neighbors: Tajikistan, Turkmenistan, and Uzbekistan to the north; Iran to the west; and Pakistan and the People's Republic of China to the south and east (see Figure 1). Mountains dominate the central and eastern part of Afghanistan, covering about three fourths of the country. Extensions of the Hindu Kush Mountains cover the central and northeast parts of the country, with many peaks exceeding 6,000 meters (m) in elevation. The mountains are young, characterized by narrow valleys and steep rugged peaks; in a number of places the effect of glaciers are evident. To the west the mountains become lower and their slopes gentler, often turning into plateaus with the surrounding peaks protruding above them. In the north the topography is characterized by hot and arid northern plains as well as several high basins. The western and southern regions are dominated by desert ecosystems, the largest being the sand desert in Registan and the clayey-rocky Dasht Margo. Steppes form wide belts of intermediate elevation and receive an average level of rainfall—more than the dry lowlands and less than the wet highlands.

The sources of the country's rivers lie in the mountains, and water levels in the rivers oscillate greatly. The highest flows are in the spring and early summer fed by snowmelt. During the other seasons the rivers may become small streams or disappear entirely. Lakes are scarce. Those in the mountains are small, mostly of postglacial origin, while those in the desert are often highly saline and dry up in the summer.

A complex of five small lakes at Band-i-Amir, located in the Koh-i-Baba Mountains, is of exceptional natural beauty and has the potential to be an ecotourism site.

Land use in each zone is largely determined by the availability of water from precipitation, groundwater, or rivers (see Figure 2). The natural vegetative patterns also closely follow the influence of water availability and altitude. In those river valleys with reasonably secure year-round water supplies, human settlements and irrigated agriculture are prevalent. As indicated in Table 1, the Food and Agriculture Organization (FAO) estimated in 1981 that 84% of land was used as rangeland (54.7 million hectares [ha]). Though there are no reliable current estimates of these figures, it is clear that changes have occurred over the past 20 years. Both irrigated agriculture and grazing activities would be expected to decline substantially because of damage to water delivery systems and loss of livestock during the period of conflict. There are indications that agricultural area—particularly rainfed cultivation—has expanded at the expense of rangelands. Table 2 shows agricultural land use data from provincial records of the early 1990s that indicate a decrease in grazing area and increase in cultivated area. Deforestation in the past decade occurred at an alarming rate,

Table 1: Land Use in Afghanistan, 1981

Use Category	Area (thousand ha)	Percent
Uncultivated	3,900	6.01
Irrigated	2,586	3.99
Rainfed	1,424	2.19
Grazing Lands	54,700	84.31
Forest	1,900	2.93
Tree Crops	372	0.57
Total	**64,882**	**100**

Source: UNDP/FAO. 1981. *Afghanistan National Parks and Wildlife Management: A Contribution to a Conservation Strategy.* Rome.

2 For more detailed analysis of the agriculture, forestry, rangelands, and other natural resource-based sectors, see: ADB. 2002. *Afghanistan Natural Resources and Agriculture Sector Comprehensive Needs Assessment—Draft Report*. Manila.

APPENDIX

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Figure 1: Map of Afghanistan



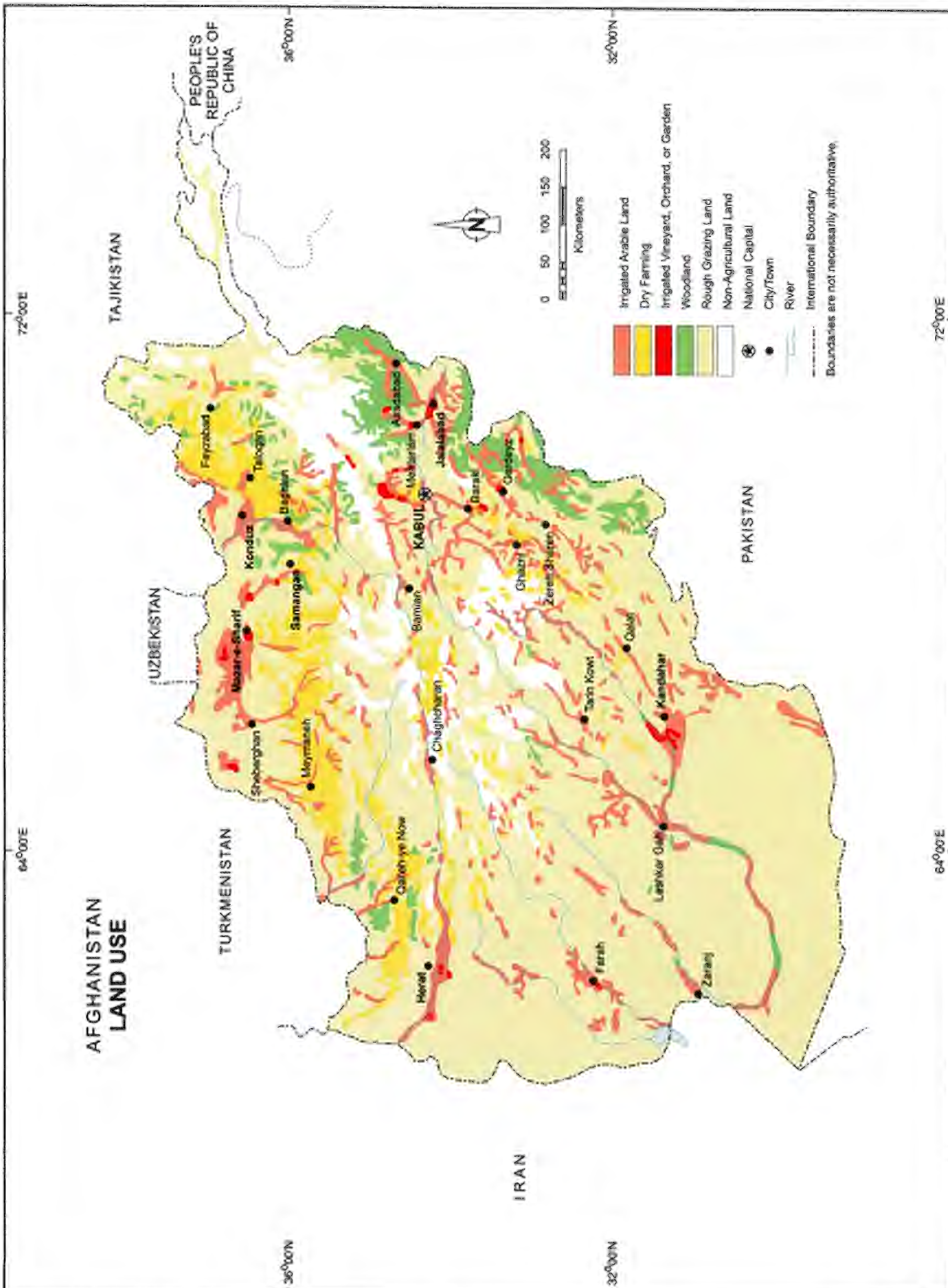


Figure 2: Land Use of Afghanistan

Table 2: Estimates of Agricultural Land Use 1990/93

Category		Area (ha)
Cultivated Land		7,724,227
Irrigated	3,206,511	
Rainfed	4,517,716	
Rangeland		32,672,733
Total Agricultural Land		**40,396,960**

Source: FAO. 1999. *Provincial Land Cover Atlas of the Islamic State of Afghanistan.*

especially in the eastern part of the country. Figure 3 shows the extent of deforestation in southeastern Afghanistan over the past 30 years, from 1971 to 1999. Figure 4 gives another picture of the relative proportions of different land uses.

Afghanistan is endowed with a wide variety of vegetative types and habitats that contribute to its unique biological resources. Short-lived vegetation grows in the sandy semi-deserts, and salt-tolerant vegetation is found in the salt semi-deserts. The most common trees found on humid soils are oaks, ashes, willows, poplars, planes, and fruit trees in orchards. Forests of the Himalayan type, including evergreen oak woods, grow in the borderland between Afghanistan and Pakistan (in Nuristan and Paktia) at an altitude of 2,400 m above sea level. Pine, spruce, and cedar trees grow at 3,500 m, whereas alpine meadows extend even higher. The slopes of Tirbandi are covered with pistachio trees.

The fauna of Afghanistan is similar to that of other Central Asian countries. Beasts of prey, like the snow leopard, brown bear, wolf, striped hyena, jackal, and fox are still found in the mountains, though their populations are assumed to be in decline. Hoofed mammals are represented by the Marco Polo sheep, markhor, ibex, and others. Surveys have been conducted sporadically over the past 30 years, but there are no reliable current estimates of wildlife populations. It is obvious that hunting and habitat degradation have decimated the indigenous fauna and flora of the country. Management of the existing network of protected areas also is in disarray. Given the country's poverty, any efforts to generate sustainable economic benefits from these resources—through ecotourism or other means—will need to pay close attention to the needs and aspirations of communities living in and adjacent to protected areas.

Figure 3: Deforestation in Southeast Afghanistan

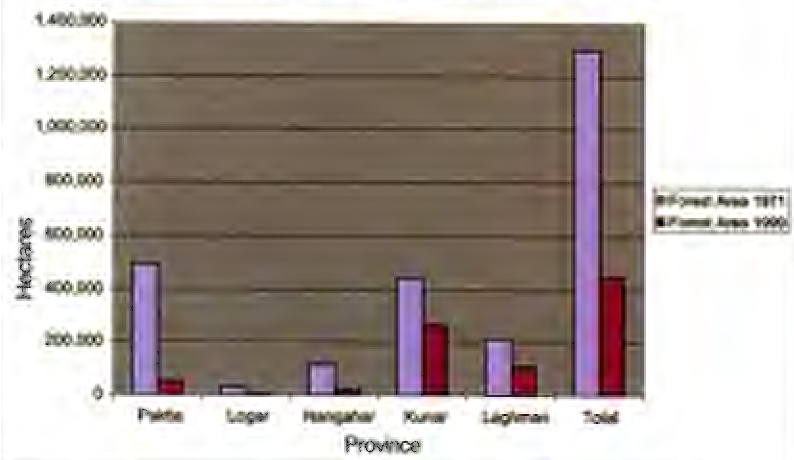
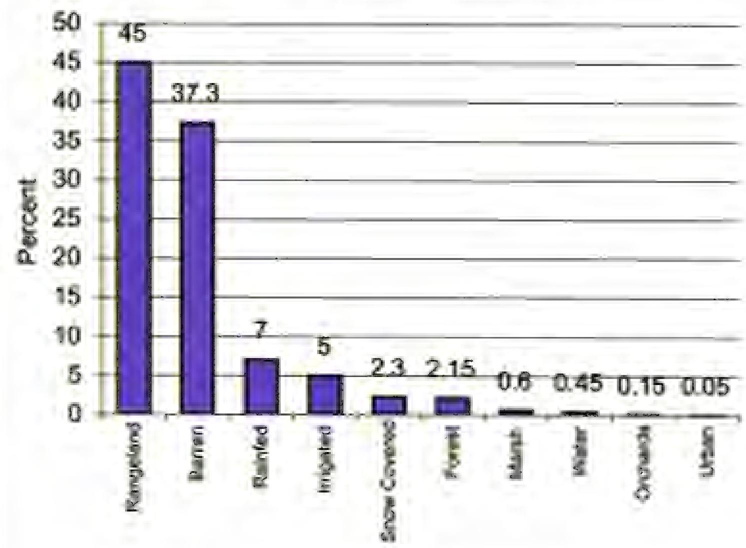


Figure 4: Land Use Distribution



Defining the Environment Sector

Sound environmental management will help to establish the necessary conditions for sustainable economic growth and social redevelopment, but it is difficult to precisely define an "environment sector." In practice, waste management and environmental protection are essential considerations in all infrastructure-related investments, such as in the transport, energy, or urban sectors. Likewise, sustainable natural resource management lies at the core of the agriculture, forestry, and pastoral sectors. For this reason, the subject of environment has been taken to be cross-cutting in nature for the CNA exercise, and no environment-specific investment projects are separately identified in this document.

Rather than an investment plan, this report presents a summarized set of perspectives on and high priority demands for environmental management in the country, and these are cross-referenced when possible with analyses presented in CNA reports covering other sectors.[3] A development framework for the "sector" also is suggested, which covers both policy and institutional needs. A work plan is then given for putting this development framework into immediate action and further refining it

3 The most important CNA in this regard is that dealing with natural resources and agriculture, already cited above, covering forest, land, and water management.

over the longer term with full participation of Afghan stakeholders. Though investment projects relating to environmental management have been covered by the other CNAs, this report includes an agenda for short-term technical assistance to achieve rapid progress in establishing necessary institutional capacity and dealing with high priority environmental problems. Finally, suggestions are made concerning an interim donor coordination mechanism for the environment sector.



Children at the Zhara Dasht UNHCR settlement camp outside Kandahar

Afghanistan faces a dearth of information across all sectors, including on the subject of Afghanistan's current environmental resources and challenges to enable priorities to be set. The development of an environmental baseline database to aid planning and monitoring is one of the high priority early actions recommended by this report. Materials identified in the course of preparing this summary report are listed in the Appendix for those seeking further information on the subject.[4]

Environmental Links between Humanitarian and Development Assistance

Environmental considerations are not a luxury unconnected to humanitarian aid or the immediate reconstruction effort. In fact, one of the most pressing immediate issues facing Afghanistan is the impact of the return of refugees and internally displaced persons (IDPs) on both its natural systems and the ability to provide urban environmental services. Between 1.4 and 2 million refugees are expected to return to their homes over the next few years along with perhaps hundreds of thousands of IDPs. It would appear to be overly simplistic to assume that all those who originally came from the countryside will return to their villages. At least in the short run, it seems likely that many returnees will either still have concerns for their security or have lost touch with their agricultural roots and willingness to face the harsh realities of Afghan rural life. This leads to the conclusion that a large portion of refugees and IDPs will settle (at least temporarily) in the cities. Indeed, this has been the pattern during the times of greatest civil unrest in the country over the past 20 years.

For those who do return to rural areas, the carrying capacity of the land to support them will depend upon its inherent productivity and the inputs available. As will be indicated below, the productive capacity of most natural systems has been greatly diminished during the period of conflict. In the short run, many inputs will need to be provided through external assistance. This donor-supported help will include: temporary food supplies to bridge the period until agricultural systems are once again productive; rehabilitation of agricultural systems, particularly to provide irrigation; seeds and fertilizers; construction materials for housing and other needs; and technical assistance associated with all of these inputs and their uses. If this support is not forthcoming, both the returning refugees and the local populace are much more likely to practice environmentally degrading and unsustainable methods of resource exploitation in order to eke out an existence. When those in rural areas—especially returning refugees—can no longer survive on what is left

4 Four reports, though dated, have been of particular use: (1) UNDP. 1993. *Afghanistan Rehabilitation Strategy: Action Plan for Immediate Rehabilitation*. Kabul. (2) Sayer, J.A. and A.P.M. van der Zon. 1981. *National Parks and Wildlife Management: Afghanistan: A Contribution to a Conservation Strategy, Vol. I: Text* and *Vol. II: Appendixes*. Rome: UNDP/FAO. (3) United Nations Office for the Co-ordination of Humanitarian and Economic Assistance Programmes Relating to Afghanistan. 1991. *Opportunities for Improved Environmental Management in Afghanistan*. Gland, Switzerland: IUCN. (4) United States Agency for International Development. 1992. *Afghanistan Environmental Profile: Phase I*. Washington, D.C.

in the countryside, they may join the urban poor, creating additional demands for employment, housing, and environmental services (e.g., water supply and both solid waste and wastewater management) in the cities to which they migrate.

The return of refugees and IDPs thus raises a variety of questions with far-reaching environmental implications that will need to be considered jointly by those managing humanitarian and development assistance programs. Despite the attempts by the ITGA, donors, and nongovernment organizations to better understand these processes, many questions remain unanswered. Does Afghanistan have sufficient properly irrigated land to support both the resident population and returnees? Where will returning refugees obtain materials for shelter and fuel? Is it realistic to expect large numbers of refugees to return to Afghanistan's countryside? If they do return to these areas, will Afghanistan's rural ecosystems experience swift and possibly irreversible degradation in the absence of substantial investment in improved rural infrastructure and the human skills needed to sustain a productive environment? If Afghanistan's cities are likely to be the main locus for returning refugees—either initially or following unsuccessful attempts at rural relocation—should not these urban environments be a major focus of attention for the provision of environmental services? Answers to such questions lie in studies being undertaken, although geographic relocation patterns for refugees and IDPs will not be clear until the process of their resettlement has been further analyzed.

CHAPTER II

SUBSECTOR NEEDS AND PERSPECTIVES

Renewable Resource Management

Water

No natural resource is more precious in Afghanistan than water, and water management systems throughout the country have been severely damaged during the years of internal strife. As the country looks ahead to peace and prosperity, both rural and urban residents alike are looking first to the restoration of water management systems to support domestic supplies, irrigation, industry, and the natural environment. It is important that an overall planning framework be adopted that is based on the principles of integrated water resources management—taking into account the need to balance urban, rural, agricultural, industrial, and environmental uses—and preferably framed within a river basin context that considers both surface and groundwater resources.[5]

Efforts are underway to identify the highest priority infrastructure investments for water management, and many of these are included in the assistance programs relating to water supply, sanitation, and agriculture (see the separate CNA documents for these project concepts and plans). Though not all water uses are consumptive in nature, competition under conditions of chronically short supply found in Afghanistan can be intense. The key water uses and concerns that should be considered are as follows:

- water supply, drainage and wastewater management in urban areas;
- rural water supply for domestic purposes;
- agricultural water use for various forms of irrigation as well as animal husbandry;
- generation of hydropower;
- water for large and small industries and associated wastewater treatment; and
- water to support natural systems such as forests, rangelands, and wetlands.

The majority of Afghans do not have access to safe water, which together with a lack of sanitation and hygiene have serious consequences for the health and well being of the populace. Even before the period of conflict, only 8% of the country's settled population had access to safe water, and it must be assumed that the situation is currently worse. Wastewater collection and drainage problems are particularly serious in urban areas, where sewage (and refuse) often is discharged directly into the streets.

Several water-related issues are of special significance from a natural resource management perspective, including land degradation from poor irrigation practices, groundwater management, and hydropower development. Problems of salinization from poorly planned agricultural drainage schemes and inefficient on-farm irrigation practices should be avoided as irrigation systems are rehabilitated. The recharge rates of many groundwater aquifers are poorly understood, so their exploitation—especially through the use of tubewells for agricultural purposes—should be handled with care. There is evidence that many deep aquifers already are being depleted at unsustainable rates, and shallow groundwater resources are susceptible to pollution. Any efforts to develop the country's enormous hydropower potential through other

5 See also: ADB. 2002. *Afghanistan Natural Resources and Agriculture Sector Comprehensive Needs Assessment—Draft Report*. Manila, especially Appendix 3: Water Resources Management, upon which this section has relied heavily.

Foreword

As Afghanistan struggles to recover from decades of war and depravation, many urgent needs are competing for the attention of the Islamic Transitional Government of Afghanistan (ITGA) and donor community. While at first thought it might seem that environmental issues are not a top priority, in fact they lie at the heart of current efforts to reestablish the basis for sustainable livelihoods for the country's people and a sound economic footing for broad-based development.

In addition to the demands of current residents, millions of refugees and internally displaced persons are returning to their homes—placing an incredible strain on Afghanistan's already seriously degraded natural resources and the ability to provide even the most basic urban environmental services. Safe drinking water and solid waste management services need to be supplied to rapidly growing urban populations to prevent widespread disease. The productivity of agricultural systems must be reestablished largely based on the rehabilitation of irrigation and animal husbandry systems if the rural population is to be fed. Deforestation is so advanced that there are severe shortages of fuelwood and building materials. Unless this trend is reversed, the country will endure heavy costs from upstream erosion and downstream siltation and seasonal flooding. Environmental issues are indeed day-to-day survival issues and are not luxuries to be dealt with later.

With this in mind, the donor community fielded to Afghanistan a team led by the Asian Development Bank and included members from the United Nations Environment Programme and the Norwegian Agency for Development Cooperation to assess Afghanistan's environmental sector needs. This was in response to a Preliminary Needs Assessment for the sector presented at the Ministerial Meeting of the Afghan Reconstruction Steering Group in Tokyo in January 2002. The environmental team met with a range of stakeholders during their visit in March 2002 and gathered information on the most pressing environmental issues facing the country. They developed a preliminary policy and institutional framework and gained an indication of the highest priorities for donor support for near-term technical assistance. The "comprehensive needs assessment" that resulted from this mission formed the basis for this report, which was compiled by Ali Azimi of ADB's South Asia Department and David McCauley, an environmental policy consultant to the Bank. The report also will serve as ADB's "Country Environmental Assessment" as required under its new environment policy.

I would like to express my sincere thanks to the ITGA for guidance provided and to the line ministries and others who gave valuable assistance, information, and guidance to the team. Along with its planned support for other key sectors such as transport, energy and agriculture and natural resources, ADB looks forward to working with the Afghans to establish the basis for sound environmental and natural resource management, especially in view that its ecological base underpins the economy.

YOSHIHIRO IWASAKI
Director General
South Asia Department



AFGHANISTAN'S ENVIRONMENT IN TRANSITION

Ali Azimi and David McCauley

Asian Development Bank

ADB

Afghanistan's

Environment in Transition

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ASIA IS A LIVING BODY, AND AFGHANISTAN IS ITS HEART

IN THE RUIN OF THE HEART LIES THE RUIN OF THE BODY

SO LONG AS THE HEART IS FREE, THE BODY REMAINS FREE

IF NOT, IT BECOMES A STRAW ADRIFT IN THE WIND

MOHAMMED IQBAL (1876-1938)



Contents

Abbreviations

AACA	Afghan Assistance Coordination Authority
ADB	Asian Development Bank
AIA	Afghan Interim Authority
ATO	Afghan Tourist Organization
CNA	Comprehensive Needs Assessment
FAO	Food and Agriculture Organization
ha	hectare
IDP	internally displaced persons
ITGA	Islamic Transitional Government of Afghanistan
IUCN	International Union for Conservation of Nature and Natural Resources
km^3	cubic kilometer
m	meter
m^3	cubic meter
NGO	nongovernment organization
PNA	Preliminary Needs Assessment
SAVE	Society for Afghanistan Volunteer Environmentalists
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

NOTE
In this report, "$" refers to US dollars